study. *Exclusion criteria of patients:* Patients younger than 18 years, those sustaining trauma, meningitis, tumour, haemorrhage, arachnoiditis, and Chiari with no presence of syringomyelia, as well as those treated by any other treatment than posterior fossa decompression were excluded. Case reports, studies with fewer than 10 patients, nonhuman in vivo, in vitro, and biomechanical studies were also excluded.

Conclusions

Rates of recurrent/residual syringomyelia after posterior fossa decompression in adults range from 0 to 22% with an average across studies of 6.7%.

The information of this statistical analysis is derived from the databases included PubMed, Cochrane and National Guideline Clearinghouse databases as well as bibliographies of key articles.

LITERATURE

1. *Alfieri, A.* Long-term results after posterior fossa decompression in syringomyelia with adult / A. Alfieri // Chiari Type I malformation. J Neurosurg Spine. – 2012. – № 17(5). – P.381–387.

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EXPLORING NEURODEGENERATIVE DISEASES OF THE CENTRAL NERVOUS SYSTEM: A STUDY ON CEREBELLAR DEGENERATION TYPES AND THEIR CLINICAL IMPLICATIONS

Introduction

Neurodegenerative diseases (NDs) are a group of neurological disorders characterized by the progressive dysfunction of neurons and glial cells, leading to their structural and functional degradation in the central and/or peripheral nervous system. Neurodegenerative diseases have primarily focused on the brain, brain stem, or spinal cord associated with disease-related symptoms, often overlooking the role of the cerebellum [1].

Aging leads to the accumulation of disabilities and diseases that limit normal body functions and is a major risk factor for neurodegenerative diseases. Many neurodegenerative diseases share oxidative stress and nitrosative stress as common terminal processes. According to free radical theory of aging, an elevation in reactive oxygen species (ROS) and reactive nitrogen species (RNS) damages neural membranes and induces oxidative and nitrosative stress. The increase in oxidative and nitrosative stress is accompanied by the concomitant decline in cognitive and motor performance in the elderly population, even in the absence of neurodegenerative diseases. Markedly increased rates of oxidative and nitrosative stress are the major factors associated with the pathogenesis of neurodegenerative diseases. Diet is a key environmental factor that affects the incidence of chronic neurodegenerative diseases. Dietary supplementation with polyphenols, resveratrol, ginkgo biloba, curcumin, ferulic acid, carotenoids, flavonoids, and n-3 fatty acids exerts beneficial effects not only through the scavenging of free radicals, but also by modulating signal transduction, gene expression, and restoring optimal neuronal communication [2].

The differential diagnosis of neurodegenerative disorders is largely based on careful clinical assessment, but imaging techniques may provide useful adjunctive information. In the case of PD, radiotracer imaging can identify those who have abnormal dopaminergic function, but relatively specialized approaches are required to differentiate the various conditions that may result in parkinsonism. Standard structural MRI is of relatively limited utility in PD, but newer techniques that assess connectivity and microstructural damage may play a role [3].

Five common symptoms that occur in both neurodegenerative disease and psychopathology are (i.e., anxiety, dysphoric mood, apathy, disinhibition, and euphoric mood) and their associated neural circuitry. Two neurodegenerative diseases (i.e., Alzheimer's disease and frontotemporal dementia) that are common and well-characterized in terms of emotion, cognition, and social behavior and in patterns of associated neuropathology. Neurodegenerative diseases provide a powerful model system for studying the neural correlates of psychopathological symptoms; this is supported by evidence indicating convergence with psychiatric syndromes (e.g., symptoms of disinhibition associated with dysfunction in orbitofrontal cortex and inferior frontal gyrus in both frontotemporal dementia and bipolar disorder) [4].

New therapies can come from three main sources: synthesis, natural products, and existing drugs. This last source is known as drug repurposing, which is the most advantageous, since the drug's pharmacokinetic and pharmacodynamic profiles are already established, and the investment put into this strategy is not as significant as for the classic development of new drugs.

Goal

The primary objective of this article is to investigate the types of cerebellar degeneration linked to neurogenerative diseases of the central nervous system, pronounced cerebellar ataxia, dysarthria and exploring underlying mechanisms, clinical implications, and the influence of genetic and environmental factors and to inform future research and improve diagnostic and treatment strategies.

Material and methods of research

The study involved the analysis of a report obtained from Gomel Regional Clinical Hospital of Invalid of Patriotic War, presenting with pathological conditions affecting the Central Nervous System primary complaints being: has been under observation for a long time with a diagnosis of spinocerebellar degeneration since 2010, currently urinary incontinence has appeared, referred for consultation to a urologist.

Upon reviewing the medical history and documentation

Results of the research and their discussion

The following were observed:

Neurological status: Conscious. Cognitive functions are normal. Speech is dysarthric, scanned. Oral automatism reflexes are bilateral. Pupils D=S, 3 mm. Eye movements are full. No sensory disturbances on the face were revealed, the trigeminal nerve exit points are painless. The face is symmetrical. Hearing and vestibular function are unchanged. The soft palate is mobile, with symmetrical sound. Swallowing of solid and liquid food is free. Tongue is along the midline. Deep reflexes from the arms and legs without a clear difference between the sides. Muscle strength is normal. Muscle tone D=S, decreased. There are no disturbances of superficial and deep sensitivity. Severe ataxia and intention tremor during coordination tests. Staggers in the Romberg position. Severe gait ataxia. There is no pathological muscle fatigue or myotonic delay. Dysfunction of the pelvic organs such as incontinence.

The materials utilized for examination included the MRI scanning of the axial, sagittal and horizontal axes of the head.

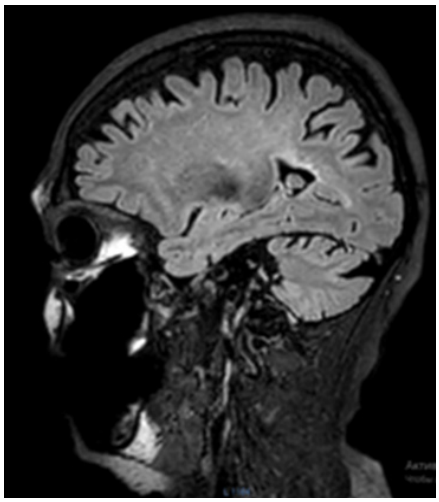

Figure 1 – MRI scanning of the sagittal axes of the head

Conclusions

This review emphasizes the critical role of cerebellar degeneration in neurodegenerative diseases and its impact on neurological function. Gaps persist in understanding its mechanisms, necessitating improved research methodologies and longitudinal studies. The patient with spinocerebellar degeneration exhibits intact cognitive functions but significant dysarthria and ataxia, alongside urinary incontinence, suggesting autonomic involvement. MRI scans are vital for confirming the diagnosis and ruling out other conditions. Neurological examination shows preserved muscle strength but decreased tone and severe coordination deficits. A multidisciplinary approach is essential for managing both neurological and pelvic dysfunctions, with further research needed to explore the link between spinocerebellar degeneration and autonomic dysfunction.

LITERATURE

1. *Liu, G.* Cerebellum in Neurodegenerative Diseases: Advances, Challenges, and Prospects /G. Liu // iScience. 2024. – Vol. 27, №. 11. – P. 194.

2. *Author, A.* Environmental Impact of Heavy Metals on Neurodegenerative Diseases / A. Author // Environmental Toxicology and Pharmacology. – 2008. – Vol. 26, №. 2. – P. 245–257.

3. *Stoessl, A. J.* Neuroimaging in the Early Diagnosis of Neurodegenerative Disease / A. J. Stoessl, // Translational Neurodegeneration. – 2012. – Vol. 1. – P. 5.

4. *Levenson, R. W.* Emotional and Behavioral Symptoms in Neurodegenerative Disease: A Model for Studying the Neural Bases of Psychopathology / R. W. Levenson // Annual Review of Clinical Psychology. – 2014. – Vol. 10. – P. 581–606.

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IMPACT OF STRESS ON COGNITIVE FUNCTION AND BRAIN STRUCTURE

Introduction

Stress, particularly chronic or prolonged stress, has profound effects on cognitive function and brain structure. Exposure to chronic stress leads to development of cognitive impairments in psychiatric disorders such as depression, anxiety disorder, obsessive compulsion disorders, post-traumatic stress disorder [1]. While acute stress can be adaptive and enhance certain